

Patent
Atty. Dkt. No. LYNN/0119

IN THE CLAIMS:

Please amend the claims according to the following replacement claim set:

1. (Currently Amended) A rubidium-82 generator, comprising:
 - (a) a strontium-82 support medium comprising sodium nonatitanate characterized by a strontium/rubidium separation factor greater than 12,500 at an alkaline pH.
2. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium selectivity greater than 250,000 mL/g at an alkaline pH.
3. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a rubidium selectivity less than 100 mL/g at an alkaline pH.
4. (Cancelled).
5. (Original) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 100,000.
6. (Original) A process for preparing a rubidium-82 generator, comprising:
 - (a) preparing sodium nonatitanate from titanium isopropoxide and aqueous sodium hydroxide;
 - (b) heating the sodium nonatitanate at a temperature between 100°C and 250°C for a period between 12 hours and 2 weeks; and
 - (c) absorbing strontium-82 on the sodium nonatitanate from an aqueous solution comprising strontium-82 and sodium chloride, wherein the sodium chloride concentration is between 0.1 and 1 molar.

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7. (Original) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is in excess of 0.44.
8. (Original) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is between 2 and 6.
9. (Currently Amended) A method of chemically isolating strontium-82 from a proton-irradiated molybdenum target, comprising:
 - (a) dissolving the molybdenum ~~metal~~ target containing the strontium-82;
 - (b) adjusting the pH of the dissolved molybdenum target solution to an alkaline pH;
 - (c) removing precipitates from the solution; and then
 - (d) absorbing the strontium-82 from the solution onto a support comprising sodium nonatitanate.
10. (Original) A process for preparing a solution containing rubidium-82, comprising:
 - (a) providing a solution containing strontium-82 at a pH between 10 and 14;
 - (b) absorbing strontium-82 onto a sodium nonatitanate support medium; and
 - (c) eluting rubidium-82 from the sodium nonatitanate support medium with a solvent.
11. (Original) The process of claim 10, wherein the solvent is selected from the group consisting of water and saline solutions.
12. (Original) The process of claim 10, wherein the solvent is an aqueous solution having a sodium chloride concentration between 0.001 molar and 1 molar.
13. (Original) The process of claim 10, wherein the solvent is an aqueous solution having a

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sodium chloride concentration between 0.2 molar and 1 molar.

14. (Original) The process of claim 10, wherein the solvent is a pharmaceutical-grade saline and buffer solution.

15. (Original) A method of chemically isolating strontium-82 from a proton-irradiated rubidium or rubidium chloride target, comprising:

- (a) dissolving the target containing the strontium-82;
- (b) adjusting the pH of the dissolved target solution to an alkaline pH;
- (c) removing precipitates from the solution; and then
- (d) absorbing the strontium-82 from the solution onto a support comprising sodium nonatitanate without absorbing rubidium.

16. (New) The rubidium-82 generator of claim 1, further comprising strontium-82 absorbed on the sodium nonatitanate.

17. (New) The rubidium-82 generator of claim 1, further comprising a sodium nonatitanate filter medium disposed to receive effluent from the strontium-82 support medium to trap strontium-82 leached from the generator.

18. (New) The rubidium-82 generator of claim 1, further comprising a column, wherein the sodium nonatitanate is disposed in the column.

19. (New) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 59,200.

20. (New) The rubidium-82 generator of claim 1, wherein the sodium nonatitanate is

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characterized by a strontium/rubidium separation factor greater than or equal to 79,500.

21. (New) The process of claim 6, wherein the aqueous sodium hydroxide is about 50 wt% sodium hydroxide.
22. (New) The process of claim 6, further comprising:
filtering the sodium nonatitanate from the solution.
23. (New) The process of claim 22, further comprising:
washing the sodium nonatitanate with ethanol.
24. (New) The process of claim 23, further comprising:
drying the sodium nonatitanate.
25. (New) The process of claim 6, wherein the molar ratio of aqueous sodium hydroxide to titanium isopropoxide is between 1 and 10.
26. (New) The process of claim 6, wherein the sodium nonatitanate is heated in a pressure vessel.
27. (New) The process of claim 6, wherein the sodium nonatitanate is prepared in the absence of chlorides and sulfates.
28. (New) The method of claim 9, wherein the molybdenum target is dissolved in hydrogen peroxide.
29. (New) The method of claim 9, wherein the pH is adjusted with sodium hydroxide.

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30. (New) The method of claim 9, wherein the pH is adjusted to about 12.
31. (New) The method of claim 9, further comprising:
stripping the strontium-82 from the sodium nonatitanate.
32. (New) The method of claim 31, wherein the strontium-82 is stripped from the sodium nonatitanate with mineral acid.
33. (New) The method of claim 9, further comprising:
washing the sodium nonatitanate with a buffer solution.
34. (New) The process of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 10,000.
35. (New) The rubidium-82 generator of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 12,500.
36. (New) The rubidium-82 generator of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.
37. (New) The rubidium-82 generator of claim 9, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.
38. (New) The process of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 10,000.
39. (New) The rubidium-82 generator of claim 10, wherein the sodium nonatitanate is

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characterized by a strontium/rubidium separation factor greater than 12,500.

40. (New) The rubidium-82 generator of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.
41. (New) The rubidium-82 generator of claim 10, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.
42. (New) The rubidium-82 generator prepared by the method of claim 6.
43. (New) The process of claim 10, further comprising:
disposing the sodium nonatitanate support medium into a column.
44. (New) The process of claim 10, wherein the solvent containing the eluted rubidium is alkaline.
45. (New) The process of claim 10, further comprising:
buffering the solvent.
46. (New) The method of claim 15, wherein the molybdenum target is dissolved in hydrogen peroxide.
47. (New) The method of claim 15, wherein the dissolved target solution includes a buffer.
48. (New) The method of claim 47, wherein the buffer is an ammonia/ammonium chloride buffer.

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49. (New) The method of claim 47, wherein the pH is between 9 and 10.
50. (New) The method of claim 15, wherein the pH is greater than 10.
51. (New) The method of claim 15, further comprising:
stripping the strontium-82 from the sodium nonatitanate.
52. (New) The method of claim 51, wherein the strontium-82 is stripped from the sodium nonatitanate with mineral acid.
53. (New) The method of claim 15, further comprising:
washing the sodium nonatitanate with a buffer solution.
54. (New) The process of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 10,000.
55. (New) The rubidium-82 generator of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than 12,500.
56. (New) The rubidium-82 generator of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 59,200.
57. (New) The rubidium-82 generator of claim 15, wherein the sodium nonatitanate is characterized by a strontium/rubidium separation factor greater than or equal to 100,000.